What is claimed is:

1. A method for making metallic interconnects comprising:

forming a patterned insulating layer on a substrate, the patterned insulating layer including at least one opening and a field surrounding the at least one opening;

depositing a barrier layer over the field and inside surfaces of the at least one opening;

depositing a first seed layer over the barrier layer using a first deposition technique;

depositing a second seed layer over the first seed layer using a second deposition technique, the first and second deposition techniques being different; and

electroplating a metallic layer over the second seed layer, the electroplated metallic layer comprising a material selected from a group consisting of Cu, Ag, or alloys comprising one or more of these metals.

2. The method of claim 1 wherein the electroplated metallic layer comprises Cu.

3. The method of claim 1 wherein the electroplated metallic layer comprises Ag.

4. The method of claim 2 further comprising:

substantially removing electroplated copper overlying the opening and overlying the field, and removing the seed layers and the barrier layer overlying the field, wherein the removing comprises one or more of a mechanical polishing technique, a chemical mechanical polishing technique, a wet etching technique, and a dry etching technique.

12 8. The method of claim 1 wherein the first deposition technique comprises a conformal deposition technique and the second deposition technique comprises a non-conformal deposition technique.

15 9. The method of claim 12 wherein:

the conformal deposition technique comprises a chemical vapor deposition (CVD) technique or an electroless technique; and

the non-conformal deposition technique comprises a physical vapor deposition (PVD) technique.

14. The method of claim 12 wherein the conformal deposition technique is a chemical vapor deposition (CVD) technique.

25. The method of claim 1 wherein the first deposition technique comprises a non-conformal deposition technique and the second deposition technique comprises a conformal deposition technique.

26. The method of claim 25 wherein:

the non-conformal deposition technique comprises a physical vapor deposition (PVD) technique; and

technique, the conformal deposition technique comprises a chemical vapor deposition (CVD or an electroless technique.

27. The method of claim 25 wherein the conformal deposition technique is a chemical vapor deposition (CVD) technique.

5. The method of claim 1 wherein the first and second seed layers comprise a material selected from a group consisting of Cu, Ag, or alloys comprising one or more of these metals.

15. The method of claim 12 wherein the first seed layer and the second seed layer comprise a material selected from a group consisting of Cu, Ag, or alloys comprising one or more of these metals.

28. The method of claim 25 wherein the first seed layer and the second seed layer comprise a material selected from a group consisting of Cu, Ag, or alloys comprising one or more of these metals.

6. The method of claim 1 wherein the first and second seed layers comprise Cu.

16. The method of claim 12 wherein the first and second seed layers comprise Cu.

16. The method of claim 8 wherein the first and second seed layers comprise Cu.

17. The method of claim 5 wherein the first seed layer has a thickness in a range of about 50Å to about 500Å over the field and the second seed layer has a thickness in a range of about 100Å to about 2,000Å over the field.

18. The method of claim 5 wherein the first seed layer has a thickness in a range of about 100Å to about 300Å over the field and the second seed layer has a thickness in a range of about 300Å to about 1,000Å over the field.

19. The method of claim 8 wherein the first seed layer has a thickness in a range of about 100 Å to about 2,000Å over the field and the second seed layer has a thickness in a range of about 50Å to about 500Å over the field.

20. The method of claim 8 wherein the first seed layer has a thickness in a range of about 300Å to about 1,000Å over the field and the second seed layer has a thickness in a range of about 100Å to about 300Å over the field.

21. The method of claim 1 wherein the barrier layer is selected from a group consisting of Ta, TaN_X, Cr, CrN_X, Ti, TiN_X, W, WN_X, or alloys comprising one or more of these materials.

22. The method of claim 1 wherein the barrier layer is deposited by a chemical vapor deposition technique.

23. The method of claim 1 wherein the barrier layer is deposited by a physical vapor deposition technique.

24. The method of claim 1 wherein the barrier layer has a thickness in a range of about 30Å to about 500Å.

25. The method of claim 1 wherein the barrier layer has a thickness in a range of about 50Å to about 300Å.

26. A method for making copper interconnects comprising:

forming a patterned insulating layer on a substrate, the patterned insulating layer including at least one opening and a field surrounding the at least one opening;

depositing a barrier layer over the patterned insulating layer including overlying the field and inside surfaces of the at least one opening, the barrier layer comprising a refractory metal or an alloy comprising a refractory metal;

chemical vapor depositing a first copper seed layer over the barrier layer, the first copper seed layer substantially continuously covering inside surfaces of the at least one opening;

physical vapor depositing a second copper seed layer over the first copper seed layer; and

electroplating copper over the second seed layer.

36. A method for making copper interconnects comprising:

forming a patterned insulating layer over a substrate, the patterned insulating layer including at least one opening and a field surrounding the at least one opening;

depositing a barrier layer over the patterned insulating layer including overlying the field and inside surfaces of the at least one opening, the barrier layer comprising a refractory metal or an alloy comprising a refractory metal;

physical vapor depositing a first copper seed layer over the barrier layer;

chemical vapor depositing a second copper seed layer over the first copper seed layer; and

electroplating copper over the second seed layer.

19 28. The method of claim 13 further comprising depositing at least one additional seed layer over the second seed layer prior to electroplating.

22 29. The method of claim 12 further comprising depositing at least one additional seed layer under the first seed layer.

20 30. The method of claim 19 wherein depositing at least one additional seed layer comprises using a conformal deposition technique.

23 31. The method of claim 22 wherein depositing at least one additional seed layer comprises using a non-conformal deposition technique.

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32. The method of claim 30 wherein the first deposition technique comprises a chemical vapor deposition technique, the second deposition technique comprises a physical vapor deposition technique, and depositing at least one additional seed layer comprises using a chemical vapor deposition technique.

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33. The method of claim 31 wherein depositing at least one additional seed layer comprises using a physical vapor deposition technique.

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34. The method of claim 28 further comprising depositing at least one additional seed layer over the second seed layer prior to electroplating.

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35. The method of claim 34 wherein depositing at least one additional seed layer comprises using a non-conformal deposition technique.

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36. The method of claim 35 wherein the first deposition technique comprises a physical vapor deposition technique, the second deposition technique comprises a chemical vapor deposition technique, and depositing at least one additional seed layer comprises using a physical vapor deposition technique.

37

37. A method for making metallic interconnects comprising:

forming a patterned insulating layer on a substrate, the patterned insulating layer including at least one opening and a field surrounding the at least one opening;

depositing a barrier layer over the field and inside surfaces of the at least one opening;

depositing two or more seed layers over the barrier layer using two or more different deposition techniques; and

electroplating a metallic layer over the two or more seed layers, the electroplated metallic layer comprising a material selected from a group consisting of Cu, Ag, or alloys comprising one or more of these metals.

38

38. Copper filled via or trench interconnects on a substrate comprising:

a patterned insulating layer formed on the substrate, the patterned insulating layer including at least one opening;

a barrier layer formed over the patterned insulating layer, including inside surfaces of the at least one opening;

a first seed layer deposited over the barrier layer, including inside surfaces of the at least one opening;

a second seed layer deposited over the first seed layer; and

an electroplated metallic layer deposited over the second deposited seed layer, said metallic layer comprising a material selected from a group consisting of Cu, Ag, or alloys comprising one or more of these metals.